

5. (a) Explain the following :
- (i) Hall effect sensors (ii) resolvers (iii) magneto resistors  
(iv) Wiegand sensors. (08)
- (b) Describe the working of electrometer amplifiers and charge amplifiers. (07)
6. (a) Enlist the various types of digital sensors and explain diagrammatically vibrating sensor and saw sensor. (08)
- (b) Explain the working of position telemetry system. (07)
7. (a) What is the need of telemetry? Compare the voltage telemetry and current telemetry system alongwith their advantages and disadvantages. (08)
- (b) Explain the sensing mechanism of CCD imaging sensors. (07)

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Fig. 1

**306501**

**December, 2019**

**B.Tech. (EIC) Vth SEMESTER**

**Sensors, Signal Conditioning and Telemetry (EI-501)**

Time : 3 Hours]

[Max. Marks : 75

**Instructions :**

1. It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.
2. Answer any four questions from Part-B in detail.
3. Different sub-parts of a question are to be attempted adjacent to each other.

**PART - A**

1. (a) Which parameter is considered as the most important parameter for sensor devices? (1.5)
- (b) Draw only the building blocks of generalized measurement system. (1.5)
- (c) What is the difference between sensors and transducers? (1.5)

(d) Which is the order of following sensors :

(i) thermistors (ii) strain gauge (iii) LDR. (1.5)

(e) Draw the circuit diagram for Wheatstone Bridge using voltage divider network. (1.5)

(f) Enlist the advantages of pyroelectric sensors. (1.5)

(g) Give the schematic difference between magneto diode and magneto transistor. (1.5)

(h) What is the requirement of RF telemetry system? (1.5)

(i) Compare the various types of transmission channels used in telemetry. (1.5)

(j) What are the sources of noise in amplifiers? (1.5)

### PART - B

2. (a) Describe the static and dynamic characteristics for a measurement system. (08)

(b) Explain the mechanism for two wire and four wire measurement system using Kelvin Bridge Method. (07)

3. (a) Describe the following :

(i) compensation in instrumentation amplifier.

(ii) ramp response of second order system. (08)

(b) Provide the mathematical formulation for gauge factor of strain gauge alongwith justification. (07)

4. (a) Determine the components in Fig. 1 in order to obtain  $G = 10$  and zero phase shift at 10 kHz for an op-amp used at input stage whose  $f_T(\text{min}) = 5 \text{ MHz}$  and  $f_T(\text{max}) = 8 \text{ MHz}$ . (08)

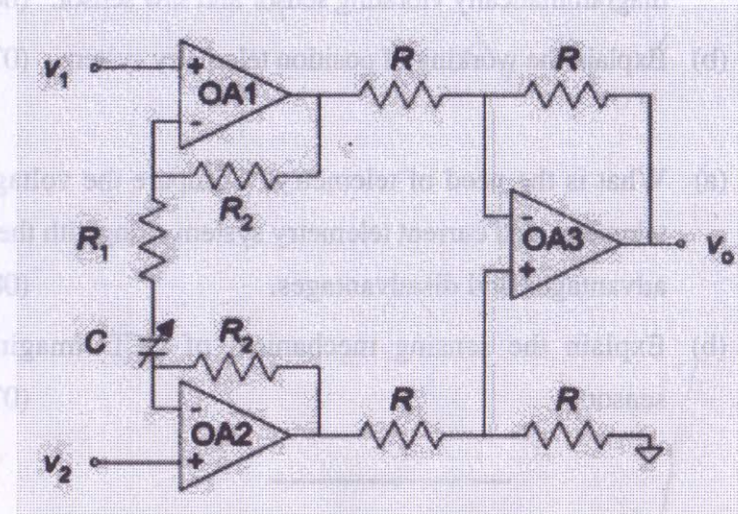


Fig. 1

(b) Describe the various type of capacitive sensor. Also describe the analog linearization in capacitive bridge. (07)